

REMARKS

[0001] Claims 1-26 and 28 are pending. The Office Action mailed January 31, 2007 (hereinafter "Office Action") rejected Claims 1-13, 15-26, and 28 under 35 U.S.C. § 103(a) as being anticipated by Dunham, et al., U.S. Patent No. 6,269,431 B1 [hereinafter "Dunham"] in view of Manley, U.S. Patent Publication No. 2003/0182325 [hereinafter "Manley"]. The Office Action rejected Claim 14 under 35 U.S.C. § 103(a) as being anticipated by Dunham and Manley as applied to Claim 12 and in further view of Asano, et al., U.S. Patent Publication No. 2003/0191909 [hereinafter "Asano"].

AMENDMENTS TO THE CLAIMS

[0002] The claims have been amended to more particularly point out the features of the present invention. The amendments are fully supported by the specification, drawings, and claims.

REJECTION OF CLAIMS 1-13, 15-26, AND 28 UNDER 35 U.S.C. § 103(a)

[0003] The Office Action rejected Claims 1-13, 15-26, and 28 under 35 U.S.C. § 103(a) as being unpatentable over Dunham in view of Manley. The Applicants respectfully traverse this rejection. The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. MPEP at § 2142. The prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP at § 2142. In addition, even if all the claim limitations are taught or suggested by the prior art references, there must be some suggestion or motivation to combine reference teachings to establish obviousness. MPEP § 2142. Obviousness may be rebutted by showing that "the art, in any material respect, teaches away from the claimed invention." MPEP at § 2144.05.III. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant." *United*

States v. Adams, 383 U.S. 39, 52, 148 USPQ 479, 484 (1966). The Applicants respectfully assert that Dunham and Manley combined fail to teach or disclose each element of the claimed invention as required under 35 U.S.C. § 103(a). The Applicants assert that there is no motivation, suggestion, or teaching in either Dunham or Manley to combine the references. The Applicants also assert that both Dunham teaches away from the Applicants' claimed invention.

[0004] With regard to Claim 1, the Office Action states that Dunham teaches "a storage pool management module (backup agent – Fig. 1, element 25) configured to monitor available storage capacity of the virtual volume and to change the storage capacity in response to the storage management policy and the available storage capacity (the backup agent responds to a request made by the host for a backup routine (i.e. change in storage capacity). The backup monitors the capacity by checking if any spare storage is available – Fig. 15 flow chart, col. 21, lines 16-63), wherein changing the storage capacity comprise allocating and de-allocating a storage volume to the virtual volume in response to the change to the storage capacity (Fig. 15, if a spare volume is available, the next virtual volume will be assigned to it – col. 21, lines 16-63). Note additionally Dunham teaches de-allocating volumes in the storage after modification access – col. 6, line 33 through col. 7, line 17." Office Action at pp. 3-4. The Applicants disagree.

[0005] Dunham teaches allocating spare primary storage capacity during a restore operation, Dunham at col. 18, ll. 27-33, col. 21, ll. 16-26, Fig. 15, steps 241, 242, and then copying a backup volume to the spare capacity of the primary volume, *id.* at col. 7, ll. 47-50, col. 18, ll. 27-33, col. 21, ll. 64-66, Fig. 15, step 244, and then assigning a new virtual volume number to the backup copy stored in the spare capacity of the primary volume. *Id.* at col. 21, ll. 20-63. The Applicants respectfully assert that Dunham does not teach changing the storage capacity of a virtual storage volume but instead teaches assigning a new virtual volume number (i.e., the next available virtual volume number) to the spare primary volume. *Id.* at col. 18, ll. 27-33, col. 21, ll. 16-26, Fig. 15, steps 241, 242. Dunham does not teach increasing storage capacity of any virtual volume by adding volumes from a storage pool. *See generally id.* Claim 1 recites allocating spare storage volumes to increase the capacity of the virtual volume that stores incremental storage data, not adding a new virtual volume.

[0006] The Applicants respectfully assert that Dunham does not teach de-allocating a storage volume of the storage pool of the virtual storage volume as recited in Claim 1. Instead, Dunham teaches de-allocating the spare storage volume on the primary storage where the backup data was copied when the virtual volume mapped to the backup data is no longer required and also releasing the virtual volume number and spare capacity for future use. *Id.* at col. 22, ll. 59-65.

[0007] Dunham also teaches in a separate, unrelated de-allocation that during a backup operation for a log-structured file system, new data is copied to a new location in the primary storage while the old data remains in its current location. *Id.* at col. 6, ll. 33-46. A snapshot of the old data is then copied to the secondary storage volume while the new data is concurrently copied to the new location on the primary volume. *Id.* at col. 46-58. Once the snapshot of the old data is copied to the secondary storage, the primary volume that the old data occupied on the primary volume is de-allocated and becomes available to store other data. *Id.* at col. 6, l. 58 to col. 7, l. 17. This de-allocation is unrelated to the allocation of spare primary storage mentioned in the restore process and the virtual volume number assigned during the restore process is unaffected by the de-allocation during backup for a log-structured file system. In addition, this de-allocation taught by Dunham does not de-allocate storage volumes to reduce capacity of the virtual volume storing incremental storage data as required in Claim 1.

[0008] In order to clarify that the allocation and de-allocation of storage volumes is related to the virtual volume that stores incremental backup data and to move along prosecution, the Applicants have amended Claim 1. The Applicants respectfully assert that neither Dunham nor Manley teaches the limitations of amended Claim 1 regarding allocating and de-allocating storage volumes to change the storage capacity of the virtual volume storing incremental backup data and that amended Claim 1 is in condition for allowance.

[0009] The Office Action also states that “[i]t would have been obvious to one of ordinary skill in the art at the time of the invention for Dunham to further include Manley’s asynchronous mirroring of snapshots into his own virtual storage system.” Office Action at p. 4. The Applicants disagree. The Applicants respectfully assert that Dunham teaches away from an

incremental storage system of any type. Dunham specifically and exclusively teaches backing up only an entire logical data structure corresponding to a physical storage unit even when only a file, directory, etc. has been requested for backup. *Id.* at col. 11, l. 49 to col. 12, l. 39. Dunham also teaches away from backing up anything less than an entire physical storage unit. *Id.* at col. 11, ll. 49-64, col. 13, ll. 22-38. Given the teachings of Dunham, one of skill in the art would be led away from any incremental backup taught by Manley or any other prior art. The Applicants respectfully suggest that combining Dunham with any other prior art that teaches an incremental backup system is improper because Dunham does not teach, disclose, or suggest any motivation for an incremental backup system and, in fact, teaches away from an incremental backup.

[0010] The Applicants respectfully assert that Claim 1 is in condition for allowance. Similarly, the Applicants assert that the arguments in favor of Claim 1 are equally applicable to Claims 16, 23, 24, and 28 are in condition for allowance. The Office Action rejected Claim 12 as unpatentable over Dunham and Manley and in further view of Asano. The Applicants disagree. The Applicants respectfully asserts also that the arguments in favor of Claim 1 apply to Claim 12 and that Dunham, Manley, and Asano do not teach the limitations discussed above with respect to Claim 1. The Applicants respectfully assert that Claim 12 is in condition for allowance.

[0011] Claims 2-11, 13-15, 17-22, and 25-26 depend on Claims 1, 12, 16, and 24, respectively. Because the invention of Claims 1, 12, 16, 23, 24, and 28 are not obvious in relation to Dunham and Manley, the Applicants respectfully assert that Claims 2-11, 13-15, 17-22, and 25-26 are similarly in condition for allowance because they depend from allowable claims. *See in re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

[0012] Should additional information be required, the Examiner is respectfully asked to notify the Applicants of such need. If any impediments to the prompt allowance of the claims can be resolved by a telephone conversation, the Examiner is respectfully requested to contact the undersigned.

Respectfully submitted,

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